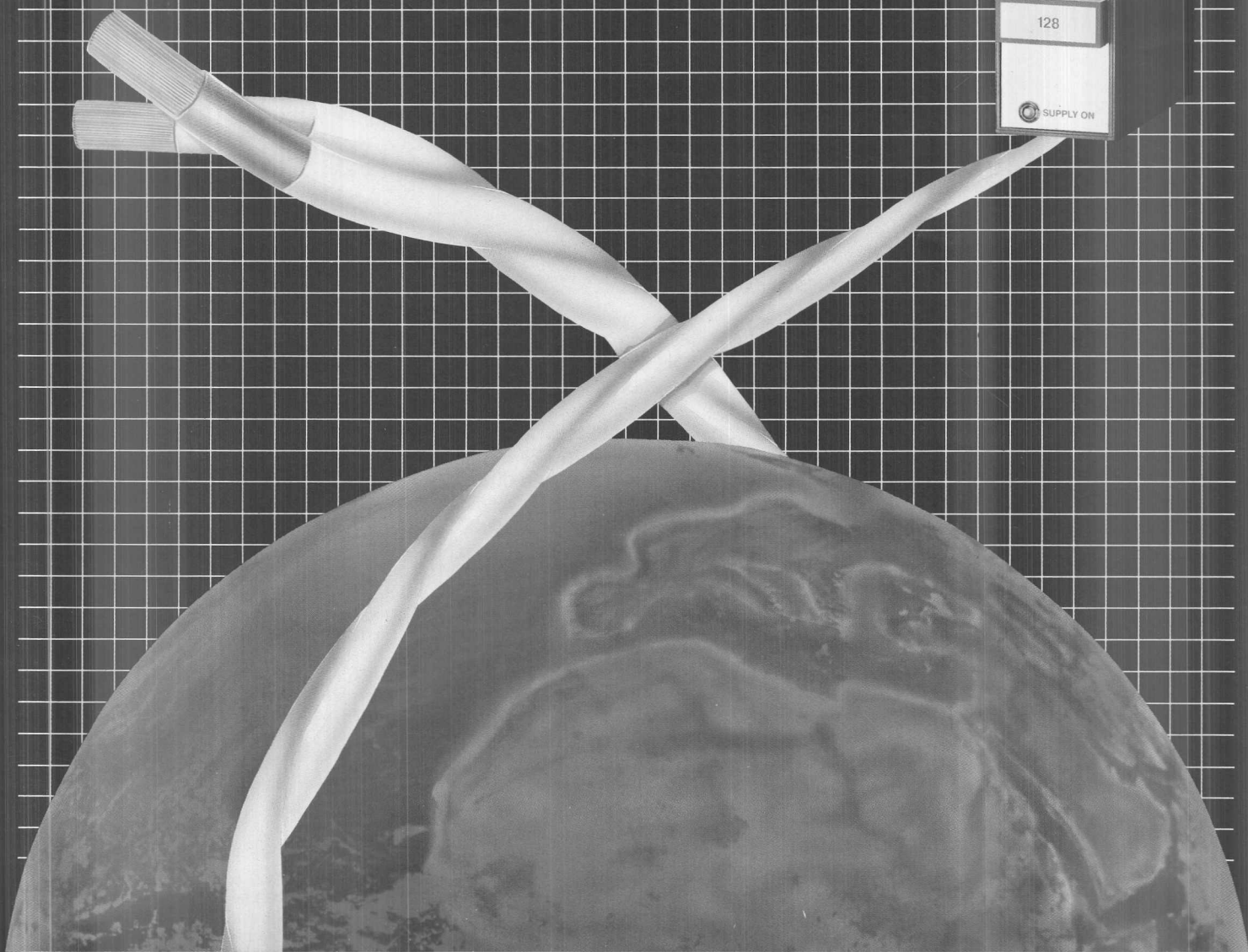


# DUPLINE<sup>®</sup> 128

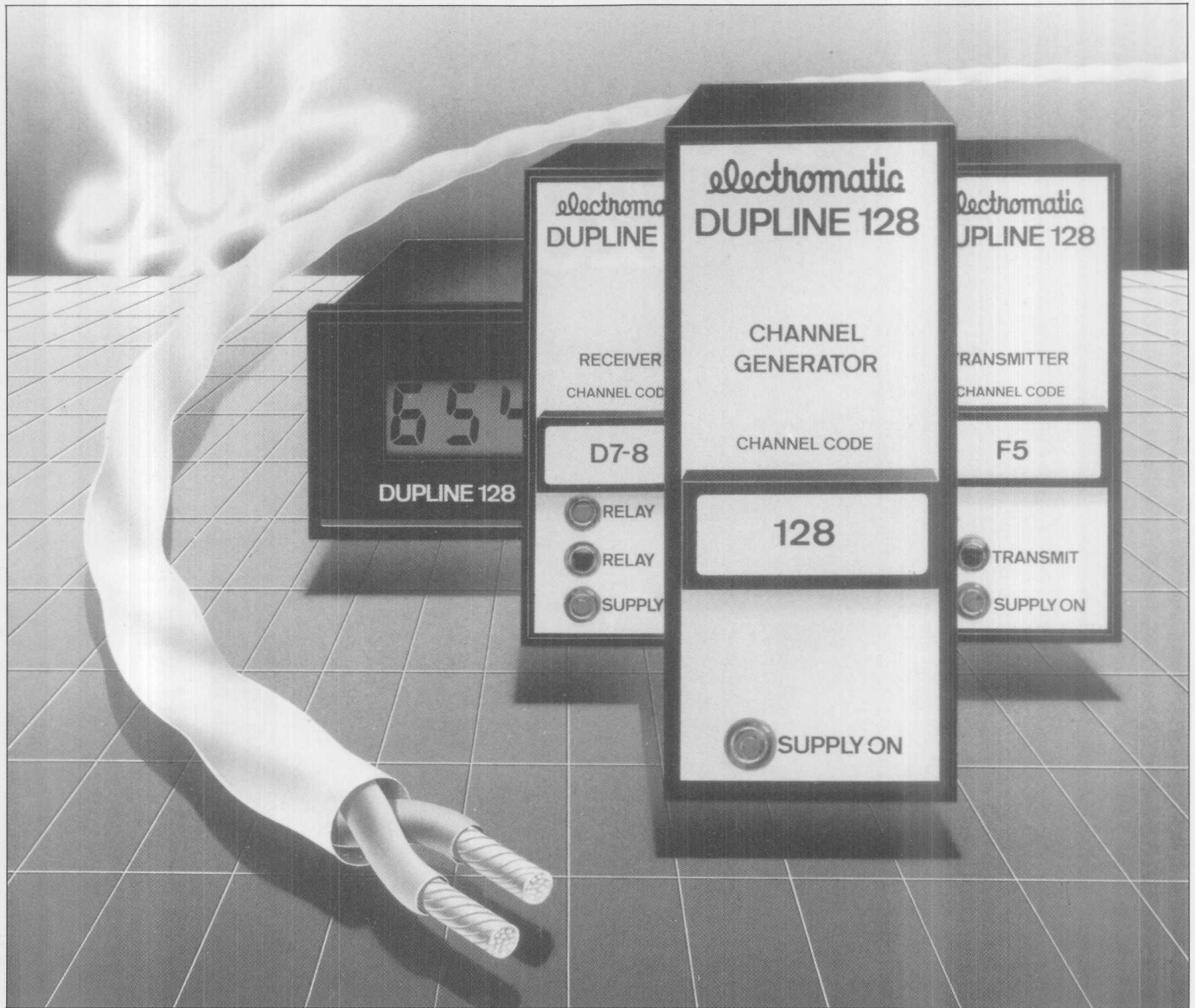


Two-wire transmission system  
for remote control



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# The Dupline system



It happens now and then within the field of electronics that a really epoch-making new product comes on the market. This has been the case with the radio, the tape recorder, the television, the pocket calculator and the computer.

It will also apply to ELECTROMATIC's new DUPLINE system, a 2-wire data transmission system consisting of modules for panel building-in and of modules for installation purposes. The DUPLINE system is made for today and for the future and will later be capable of forming part of a wide hybrid network, but meanwhile it can be used as independent monitoring and control units.

The DUPLINE system is based on 3 modules: a channel generator, a transmitter and a receiver — all working on a transmission line. With one channel generator on one transmission line these basic

modules can emit and receive up to 128 signals at the same time and in all directions.

The general idea of the DUPLINE system is to place up to 128 transmitters, each having its own channel code, at random along a 2-wire cable of up to 10-15 km. Likewise at random are placed 128 receivers, each coded to work on one channel corresponding to the transmitters.

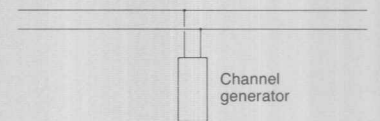
## Function

The DUPLINE system is a 2-wire transmission system capable of transmitting 128 mutually independent signals simultaneously in any direction and over distances of up to 10-15 km and furthermore over long distances through our telephone modems.

The channel generator is the heart and brain of the DUPLINE system.

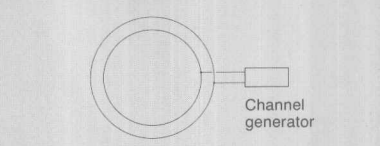
## Placement of channel generator

The transmission lines can be placed in a long straight line:



The channel generator can be connected to any point of the line, but in the case of extremely long lines (5-15 km) it is recommended to connect the channel generator in the middle of the line.

The transmission lines can also be placed in a circle:



In this case it is of no importance as far as function is concerned, where the channel generator is placed, but it would be a good idea to place the channel generator near the highest amount of transmitters.

The channel generator, programmable by means of a code module, can produce 8, 16, 32, 64 or 128 channels as required.

At the same time it works as power supply for transmitters which have no power supply of their own.

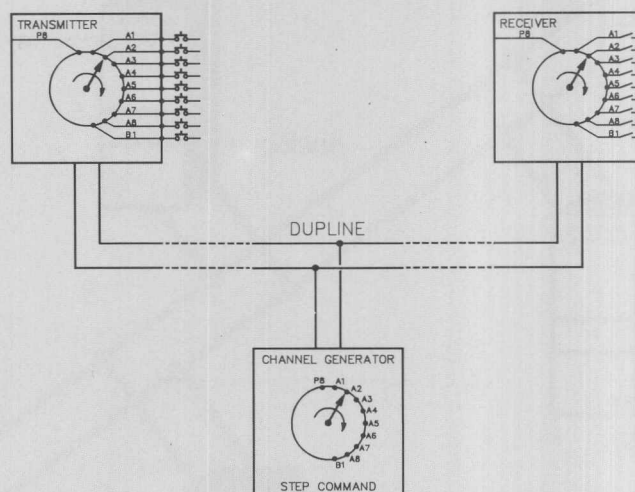
The channels produced by the channel generator can each signify a digital signal: »0« or »1«. Analogue input-signals can be transmitted using transmitters containing analogue to digital converters.

The transmitter is programmed by a code module to transmit on one or more channels. If the transmitter input is activated, the transmitter will activate the receiver through the channel generator and change the channel status. A change in channel status will be registered by all receivers coded for this channel along the transmission lines.

The transmission lines can be any two-wire twisted cable selected only by resistance and capacitance parameters. Such cables could be telephone wires, ordinary installation cable, shielded if required.

It is possible to switch to another kind of cable throughout the installation. As an example you can use an ordinary telephone cable over a distance and then switch to a shielded cable.

#### Simplified Dupline:



If for instance transmitter contact A2 is activated, the receiver contact having the same number (A2) will be activated when it becomes its turn during the sequence.

the next sequence will then either release or remain activated depending on the position of the transmitter contact.

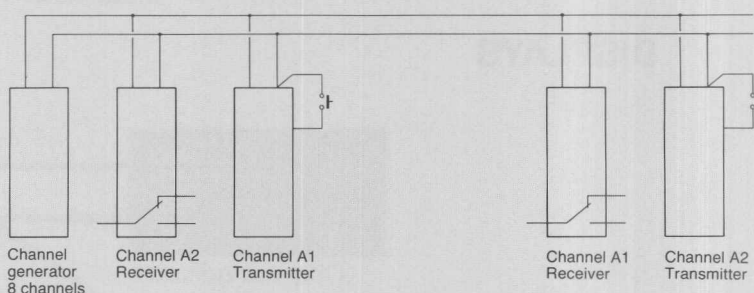
The receiver contact will automatically remain activated for one sequence and in

This shows that all 128 contact functions (1 sequence) can be transmitted simultaneously on the Dupline.

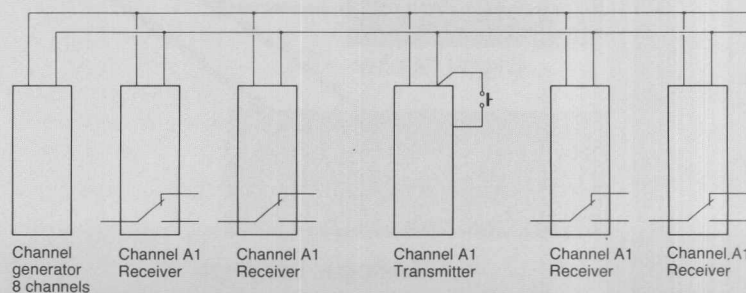
#### The transmission system in its simplest form:



#### You can also re-transmit signals:

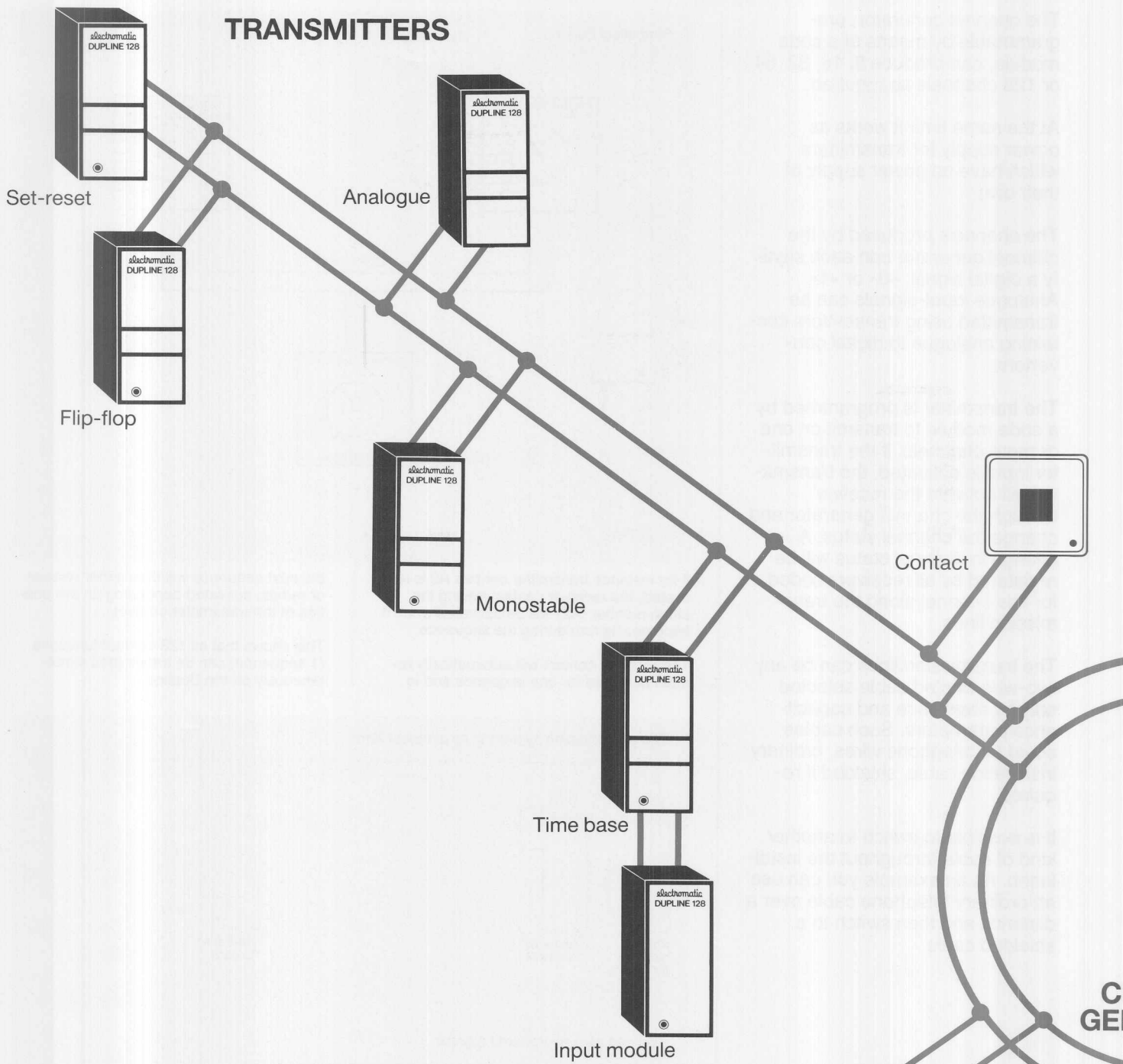


#### One transmitter can control several receivers:

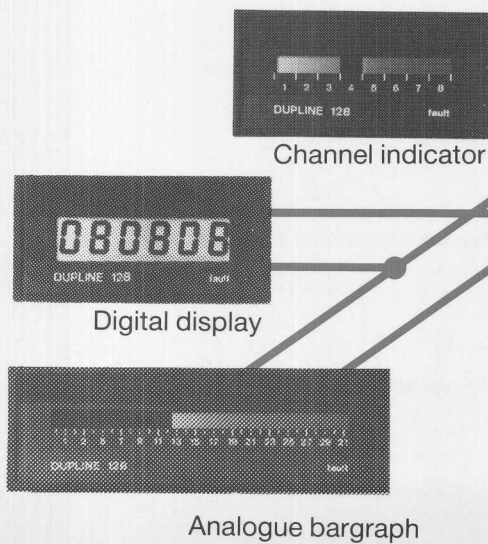




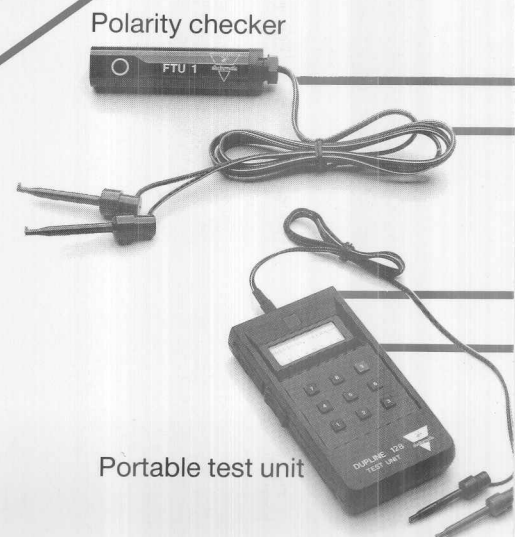
## TRANSMITTERS



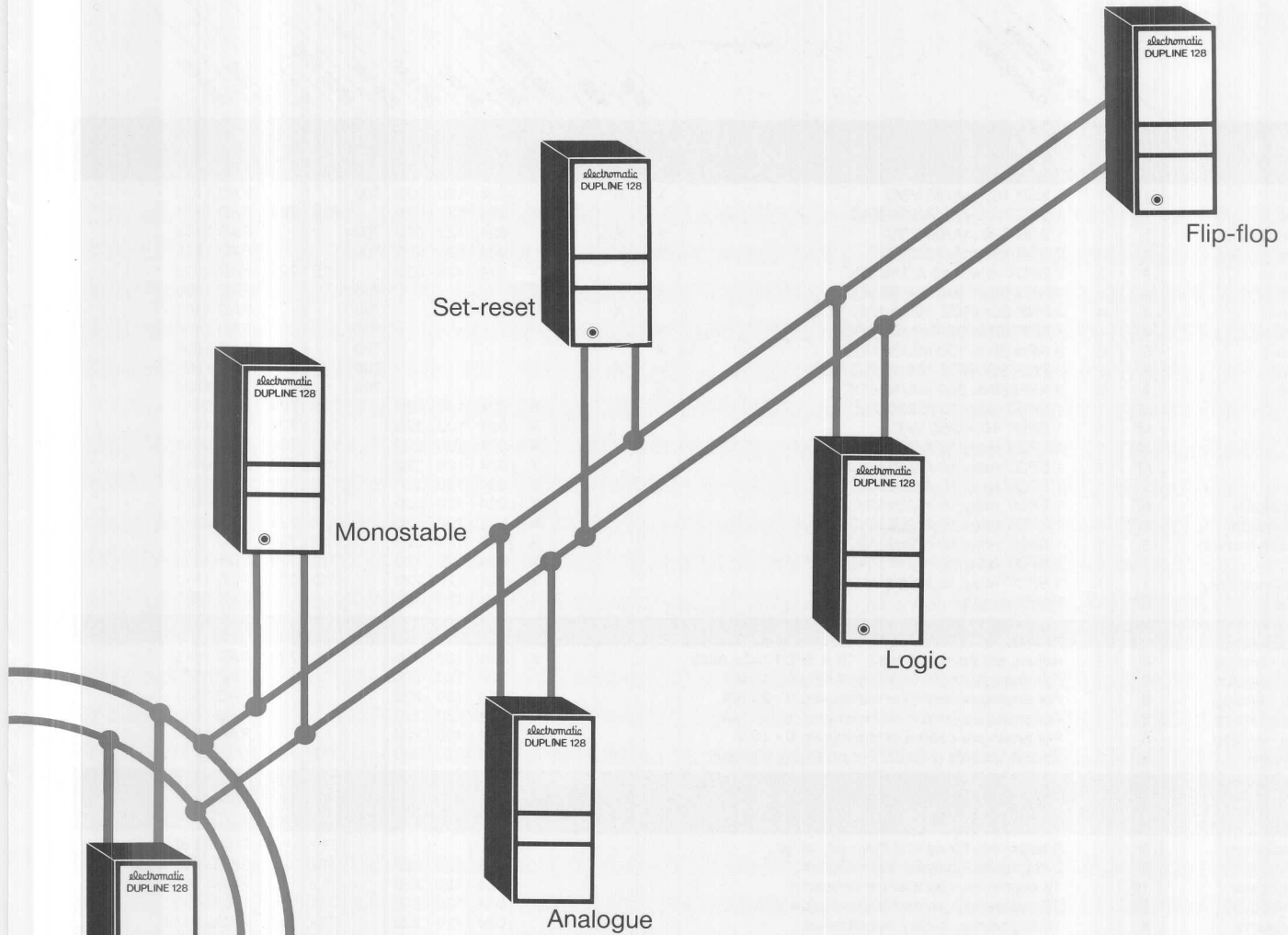
## DISPLAYS



## TEST UNITS

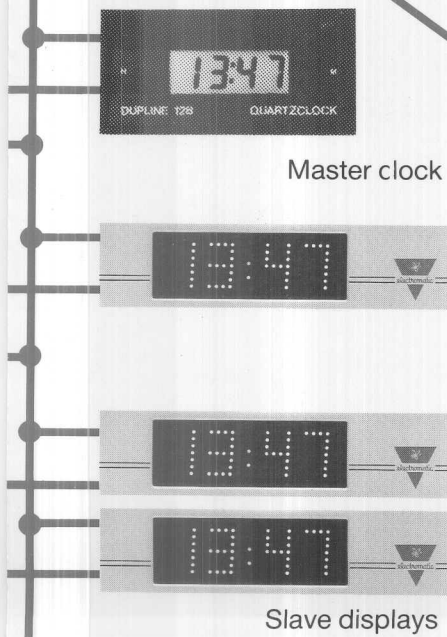


## RECEIVERS

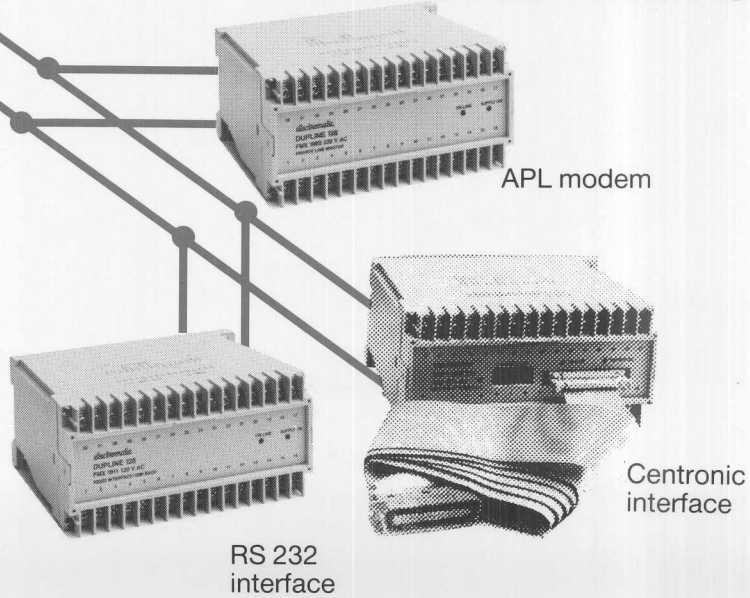


ANNEL  
RATOR

## CLOCKS



## MODEMS AND INTERFACES



# Production programme

Function	Channel	No. of outputs	Description	NPN	PNP	Triac (SSR)	SPDT	24 VAC	120 VAC	220 VAC	10-30 VDC	12 VDC	24 VDC	Type no.
<b>Receivers</b>														
Monostable	1	1	1 SSR 100 mA/30 VDC	X	X			024	120	220	700			FAD 1110
Monostable	1	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FAD 1111
Monostable	1	1	1 SSR 500 mA/60 VDC	X	X			024	120	220	700			FAD 1114
Monostable	2	2	2 SSR 100 mA/30 VDC	X	X			024	120	220	700			FAD 1210
Monostable	2	2	2 SPDT relays 10 A/250 VAC				X	024	120	220		712	724	FAD 1213
Monostable	4	4	4 NPN SINK 100 mA/30 VDC	X						700				FAD 1400
Monostable	4	4	4 PNP SOURCE 100 mA/30 VDC		X					700				FAD 1401
Monostable	4	4	4 NPN SINK 500 mA/60 VDC	X						700				FAD 1404
Monostable	8	8	8 NPN SINK 100 mA/30 VDC	X						700				FAD 1500
Monostable	8	8	8 PNP SOURCE 100 mA/30 VDC		X					700				FAD 1501
Monostable	8	8	8 NPN SINK 500 mA/60 VDC	X						700				FAD 1504
Or	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FAD 3911
Nor	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FAD 4911
And	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FAD 5911
Nand	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FAD 6911
Set-reset	2	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FBD 1211
Multi-nor-bistable	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FBD 4911
Multi-and-bistable	M*	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FBD 5911
Set-reset with memory	2	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FCD 1211
Flip-flop	1	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FDD 1111
Flip-flop with memory	1	1	1 SPDT relay 10 A/250 VAC				X	024	120	220		712	724	FED 1111
Monostable	64	8x8	Matrix output					024	120	220				FAX 1861
<b>Special functions</b>														
8 bit binary - analog	8	1	Adjust. set point and hyst., 10 A SPDT outp. relay				X	024	120	220		712	724	FAD 1511
8 bit binary - analog	8		For analogue control or measuring 0 - 1 mA					024	120	220				FAD 1530
8 bit binary - analog	8		For analogue control or measuring 0 - 20 mA					024	120	220				FAD 1531
8 bit binary - analog	8		For analogue control or measuring 4 - 20 mA					024	120	220				FAD 1532
8 bit binary - analog	8		For analogue control or measuring 0 - 10 V					024	120	220				FAD 1533
Enable receiver	8		Enable/disable outputs. For analogue transmit.					024	120	220		712		D 1230 5111
<b>Displays</b>														
Channel indicator	8		8 segments for optical fiber, gn, rd, yl.									712		D 8360 5505
Channel indicator	8		8 segments - parallel transmission					024	120	220		712		FK3C 3508
Channel indicator	16		16 segments - parallel transmission					024	120	220		712		FK3C 3616
Channel indicator	32		32 segments - parallel transmission					024	120	220		712		FK4C 3732
Analog bargraph	4		16 segments - binary transmission					024	120	220		712		FK3C 5416
Analog bargraph	8		32 segments - binary transmission					024	120	220		712		FK4C 5532
Digital display	16		0 - 9999 7 segments parallel BCD transmission					024	120	220		712		FK3C 7640
Digital display	32		0 - 999999 7 segments parallel BCD transmission					024	120	220		712		FK3C 7760
Channel indicator	8		8 segments - parallel transmission					024	120	220	700			FL3C 3508
Channel indicator	16		16 segments - parallel transmission					024	120	220	700			FL3C 3616
Channel indicator	32		32 segments - parallel transmission					024	120	220	700			FL4C 3732
Analog bargraph	4		16 segments - binary transmission					024	120	220	700			FL3C 5416
Analog bargraph	8		32 segments transmission					024	120	220	700			FL4C 5532
Digital display	8		0 - 99 7 segments parallel BCD transmission					024	120	220	700			FL3C 7520
Digital display	16		0 - 9999 7 segments parallel BCD transmission					024	120	220	700			FL3C 7640
Digital display	32		0 - 999999 7 segments parallel BCD transmission					024	120	220	700			FL3C 7760

\*M-Multi:  
1, 2, 4, 8, 16, 32,  
64 or 128 channels.

Type FKxC: LED-display.  
Type FLxC: LCD-display.



# Production programme

Function	Description	Channel	No. of inputs	Contact	NPN	6-32 VDC	24 VAC	120 VAC	220 VAC	10-30 VDC	24 VDC	Type no.
<b>Transmitters</b>												
supplied through 2-wire transmission line												
Monostable	1 contact 8 V - 8 $\mu$ A	1	1	X								FGD 1110
Monostable	2 contacts 8 V - 8 $\mu$ A	2	2	X								FGD 1220
Monostable	4 contacts 8 V - 8 $\mu$ A	4	4	X								FGD 1440
Monostable	8 contacts 8 V - 8 $\mu$ A	8	8	X								FGD 1550
Flip-flop	1 contacts 8 V - 8 $\mu$ A	1	1	X								FGD 3110
Bistable	2 contacts 8 V - 8 $\mu$ A	1	2	X								FGD 3120
Bistable (matrix 4 $\times$ 4)	16 contacts	4	16	X								FGD 3466
Monostable with delay on transmit	1 built-in contact	1										D 8110 1100
Monostable with delay on transmit	2 built-in contacts	2										D 8110 2200
Flip-flop	1 built-in contact	1										D 8112 1100
Flip-flop with LED for transmit	1 built-in contact	1										D 8112 1100-1
Flip-flop with LED for non transmit	1 built-in contact	1										D 8112 1100-2
2 $\times$ flip-flop	2 built-in contacts	2										D 8112 2200
Monostable	Magnet activation	1										D 8910 1100
Monostable	Magnet activation	1										D 8910 1100-G
Monostable	Inductive sensor	1										D 8910 1105
Monostable	Current metering transf., adjust.: 1.5 - 20 AAC	1										D 8910 1107
<b>Separately supplied</b>												
Monostable	1 contact/NPN 8 V - 3 mA	1	1	X	X	024	120	220	700			FFD 1110
Monostable	1 voltage input 6 - 32 V 27 K $\Omega$	1	1			X	024	120	220	700		FFD 1111
Monostable	2 contacts/NPN 8 V - 3 mA	2	2	X	X		024	120	220	700		FFD 1220
Monostable	2 voltage inputs 6 - 32 V 27 K $\Omega$	2	2			X	024	120	220	700		FFD 1221
Monostable	4 contact inputs/NPN 8 V - 3 mA	4	4	X	X		024	120	220	700		FFD 1440
Monostable	4 voltage inputs 6 - 32 V 27 K $\Omega$	4	4			X	024	120	220	700		FFD 1441
Monostable	8 contacts/NPN 8 V - 3 mA	8	8	X	X					700		FFD 1550
Monostable	8 voltage inputs 6 - 32 V 27 K $\Omega$	8	8			X				700		FFD 1551
Flip-flop	1 contact/NPN 8 V - 3 mA	1	1	X	X		024	120	220	700		FFD 3110
Flip-flop	1 voltage inputs 6 - 32 V 27 K $\Omega$	1	1			X	024	120	220	700		FFD 3111
Bistable	2 contact inputs/NPN 8 V - 3 mA	1	2	X	X		024	120	220	700		FFD 3120
Bistable	2 voltage inputs 6 - 32 V 27 K $\Omega$	1	2			X	024	120	220	700		FFD 3121
Bistable (matrix 4 $\times$ 4)	16 contacts	4	16	X						700		FFD 3466
Monostable (matrix 8 $\times$ 8)	64 contacts	64	64	X	X		024	120	220			FFX 1861
<b>Special functions</b>												
Analog	8 bit binary	0 - 1 mA	8	1			024	120	220			FFD 1530
Analog	8 bit binary	0 - 20 mA	8	1			024	120	220			FFD 1531
Analog	8 bit binary	4 - 20 mA	8	1			024	120	220			FFD 1532
Analog	8 bit binary	0 - 10 V	8	1			024	120	220			FFD 1533
Temperature	8 bit binary	ETR sensor	8	1			024	120	220			FFD 1571
Time base	8 bit binary	FPD 5002/5031/5035 input modules	8	1			024	120	220			FFD 1581
Time base	4 digit BCD	FPD 50xx input module	16	1			024	120	220			FFD 1681
Counter	4 digit BCD		16	1	X	X	024	120	220			FFD 1680
Counter	6 digit BCD		32	1	X	X	024	120	220			FFD 1780
Thermostat with night set-back		Built-in sensor, adj.: 14-28°C, night set-back: 4°C	2									D 8910 1111
Pyro detector		Passive infrared detector with timer	1									D 8910 1125
<b>Input modules</b>												
Temperature		0 - 120°C ETR sensor					*					FPD 5001
Temperature		0 - 200°C PT 100 sensor					*					FPD 5002
Temperature		0 - 750°C PT 100 sensor					*					FPD 5003
Current		0 - 20 mA					024	120	220			FPD 5031
Current		4 - 20 mA (0-100%)					024	120	220			FPD 5032
Voltage		0 - 200 mV					024	120	220			FPD 5035
Revolution		0 - 1000 RPM (CR ...)					*					FPD 5050
Revolution		0 - 10000 RPM (NAMUR)					*					FPD 5051
<b>Miscellaneous</b>												
Channel generator		Selection of sequences (1-2-3)	128				024	120	220	824		FPD 1901
Channel generator		Built-in time delay	128				024	120	220		724	FPD 1910
Modem Dupline - private line		Master unit	128				024	120	220			FMX 1902
Modem Dupline - private line		Slave unit	128				024	120	220			FMX 1903
Interface Dupline - RS 232		Serial computer interface	128				024	120	220			FMX 1911
Interface Dupline - Centronic		Printer interface	128				024	120	220			FMX 1912
Optolink		Dupline modem, optical fiber/3-wire current loop	128				024	120	220			D 7191 0000
Optolink		Dupline modem, optical fiber/1200 BAUD	128				024	120	220			D 7191 0001
Interface, Optolink - RS 232		Serial computer interface, optical fiber/3-wire	128				024	120	220			OLI V24
Interface PC-Dupline		PC-card for IBM-compatible computer	128									D 879191
Transceiver		Transmitter: 4 contacts/NPN trans. 8 V - 3 mA Receiver: 4 NPN SINK 100 mA/30 VDC	4							700		FXD 1400
Master clock		4-digit, 24 hours function	16				024	120	220			FW3C 1610
Slave display for master clock		4-digit, 64 mm LED, 24 hours function	16				024	120	220			FKX 7640
Polarity checker		Test unit for the Dupline system										FTU 1
Portable test unit		Monitoring - and transmitting mode	128									FTU 8
Power supply		Output 12 - 18 VDC/0 - 160 mA					024	120	220			FPD 8000
Power supply		Output 12 VDC/0.5 A					024	120	220			FPD 8012
Power supply		Output 24 VDC/0.3 A					024	120	220			FPD 8024
Micro programmable controller		32/32 in/outputs	64				024	120	220			PLCF 223232/323232
Code module		1, 2, 4, 8, 16, 32, 64, 128 channels										FMK XX
Base		11-pole base										D 411B
Base cover		Cover of front screw connections										BB 5B
Termination unit		Signal ringing reduction										DT 01

\*Supply by time base transmitter.

# Common technical data

## Power supply

AC power supply:  
220 = 220 VAC  $\pm 10\%$   
120 = 120 VAC  $\pm 10\%$   
024 = 24 VAC  $\pm 10\%$   
45 to 65 Hz.

DC power supply:  
700 = 10 to 30 VDC  
712 = 12 VDC  $\pm 10\%$   
724 = 24 VDC  $\pm 10\%$ .

## Supply interruptions

No Dupline system reacts to supply interruptions of less than 2 cycles.

## Voltage stabilization

All Dupline systems have built-in voltage stabilization.

## Test voltage

2000 VAC.  
All Dupline systems for AC power supply are equipped with built-in transformer for galvanically separating the electronic circuit and the power supply.

## Transient protection

3 KV.

## Duration of connection

100%.

## Ambient temperature

Transmitters and receivers:

Operation -20 to +50°C (-4 to +122°F)  
Storage -50 to +85°C (-58 to +185°F).

Displays, interface and modem:

Operation 0 to +50°C (+32 to +122°F)  
Storage -20 to +60°C (-4 to +140°F).

## Relay contacts

Receivers with SPDT relay:  
AC: 300 VAC — 10 A — 2500 VA,  
resistive load.  
DC: 250 VDC — 1 A — 250 W or  
25 VDC — 10 A — 250 W.

## Mechanical life

30 mill. operations.

## Electrical life

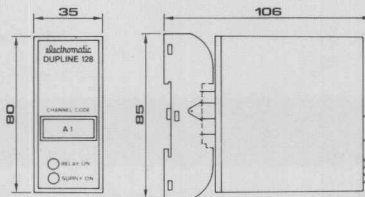
250,000 operations at max. load.

## Operational speed

Max. 7,200 operations per hour.

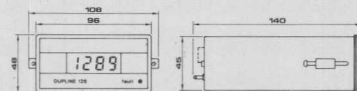
## Test voltage

All output contacts are galvanically separated from the power supply and from the electronic circuit.  
2000 VAC.



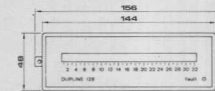
### Type FXD

Material: Noryl SE 1.  
Colour: Black.  
Weight: DC supply: approx. 125 g.  
AC supply: approx. 200 g.



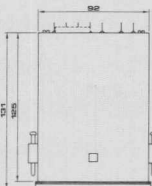
### Type FX3C

Material: Glasfilled noryl.  
Colour: Black.  
Weight:  
DC supply: approx. 200 g.  
AC supply: approx. 300 g.



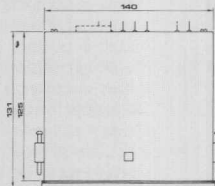
### Type FX4C

Material: Glasfilled noryl.  
Colour: Black.  
Weight:  
DC supply: approx. 300 g.  
AC supply: approx. 400 g.



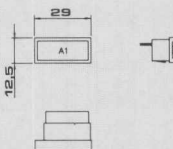
### Type FMK

Material: Noryl SE 1.  
Colour: Black.  
Weight: Approx. 5 g.



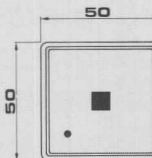
### Type FMX

Material: Housing: ABS.  
Frontplate: Polycarbonate.  
Colour: Grey.  
Weight: Approx. 750 g.



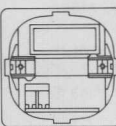
### Type D8110/D8112

Material: ABS.  
Colour: Grey.  
Weight: Approx. 60 g.



### Type D8910 1100

Material: ABS.  
Colour: Black.  
Weight: Approx. 40 g.



### Type D8910 1100-G

Material: ABS.  
Colour: Black.  
Weight: Approx. 60 g.  
Thread:  
Nickel-plated brass.

## BELGIE BELGIQUE

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